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Alcoholism as a Problem of Public Health¹

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TWO statements about alcoholism are being made with increasing frequency and conviction (1) "Alcoholism is a disease"; (2) "Alcoholism is a public health problem". The purpose of these statements is to place the responsibility for doing something about alcoholism firmly on the shoulders of governments and of the medical profession. Five provincial governments in Canada have accepted the responsibility and have established facilities for the treatment of alcoholics. One reason why governments have not done more is that the medical profession is hardly in a position yet to tell them exactly what to do.

Much has been written about alcoholism in recent years by medical and social scientists. As yet scientific views on the subject are far from unanimous. Terminology is still confusing and hypotheses tend to be fragmentary. Nevertheless the picture is getting clearer and more coherent. Excellent leadership has been provided by an Expert Committee of the World Health Organization, on alcohol and alcoholism. One of their recent technical reports (1) presents a classification of disorders induced by alcohol which is more comprehensive and coherent than any proposed hitherto.

If alcoholism is a disease and a public health problem it should be possible now to describe it and analyze it in the terms which have proven their value in medical science. Let us see then how our knowledge looks when we try to synopsise it under the familiar headings: definition, diagnosis, prevalence, incidence, prognosis, aetiology, treatment, and prevention.

DEFINITION

Alcoholism includes a number of patterns of behaviour characterized by repeated excessive consumption of alcoholic beverages and having the attributes of mental or physical disease. By this definition alcoholism is a chronic

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disease. The term, chronic alcoholism, is redundant except when it is necessary to emphasize that one does not mean acute intoxication.

The term "problem drinker" is a euphemistic expression which is frequently used as a synonym. It should not be stretched to include the problems of occasional intoxication, no matter how serious these may be.

Alcohol addiction, as defined by Jellinek (2), is an expression which requires some explanation. It refers to a phase or type of alcoholism of which the cardinal sign is "loss of control." Loss of control means inability to stop short of severe intoxication after a few drinks. The picture is one of recurrent bouts of intoxication lasting for many days or weeks. Loss of control usually follows many years of heavy but relatively controlled drinking. It marks an irreversible change, a point of no return. Hence the expressions often used in Alcoholics Anonymous, "once an alcoholic always an alcoholic," "an alcoholic is a person one drink from a drunk," "alcoholism can be arrested but never cured."

Jellinek (2) favours the division of alcoholics into two classes: habitual symptomatic excessive drinkers and alcohol addicts. The use of the term addiction in this narrow sense conflicts with its wider meaning of "harmful dependence" which applies to the whole concept of alcoholism. It seems doubtful that a sharp or useful distinction can be made between these two classes.

DIAGNOSIS

It must be admitted that the diagnosis of alcoholism in its early stages is far from objective or certain. The diagnostic methods and aims of the therapist differ considerably from those of the public health investigator. The problem of the former is to design a treatment to fit an individual. The major problem of the latter at this time is to assess the magnitude of a socially disabling disease. Alcoholism is not a reportable disease in this country. There is no simple diagnostic test which can be used in a survey. The investigator is left only with the tedious and subjective method of collecting and cross-checking evidence of social maladjustment associated with repeated excessive drinking.

PREVALENCE

The best method available in this country to assess the prevalence of alcoholism is a well designed survey. One of the most recent and best surveys was conducted four years ago in a typical county of Ontario by Gibbins (3) with support from the Alcoholism Research Foundation of Ontario. This survey disclosed in X county 698 alcoholics, 620 men, 78 women. There is reason to suspect that some alcoholic women were overlooked. Multiplying by a factor for population, it was estimated that in 1951 there were approximately 49,000 alcoholics in Ontario. One conclusion which seems obvious is that if the number is anywhere near this size several more surveys should be done in other localities both in Ontario and elsewhere in Canada.

One purpose of the survey was to test the Jellinek estimation formula. The Jellinek formula was designed to estimate the number of alcoholics in any given area from the number of deaths in that area reported in the official records as due to cirrhosis of the liver. For X county in Ontario the number estimated by the formula was 696 as compared to 698 found in the survey. Independent surveys have been made elsewhere to test the Jellinek formula,

namely in Denmark, in Switzerland, in Chile and in several localities in the United States. Agreement between the estimates by the formula and by survey was satisfactory in 5 out of 7 regions. In Chile more alcoholics were found by survey than were estimated by the formula; in Kansas fewer were found by survey than predicted by the formula (4). On the strength of such evidence it was considered worth while to make estimates by formula of the rate of alcoholism in the various provinces and in Canada as a whole since 1901. The rates by provinces are shown in table I, which is taken from an article by Popham (5). The differences are interesting! Are they credible? All that we can say at present is that these figures should not be ignored. They are the best available estimates. They challenge further investigation.

The rates for all Canada from 1901 to 1951 are shown in table II. The fall during the period of prohibition and the subsequent rise parallel changes shown in the figures for the United States. Perhaps we can take some comfort in the fact that the estimated prevalence of alcoholism has always been much lower in Canada than in the United States, but our rates are climbing rapidly. The estimate for Ontario for 1956 is 76,000. We have no reason for complacency.

TABLE I
ALCOHOLISM IN CANADA BY PROVINCES

Province	Rate*
British Columbia	2,532
Quebec	1,813
Ontario	1,687
Nova Scotia	1,286
New Brunswick	1,278
Manitoba	1,173
Saskatchewan	1,167
Alberta	980
Prince Edward Island	675
Newfoundland	501

*Estimated number of alcoholics per 100,000 of population over the age of 20 (Popham, 1955)

TABLE II
ALCOHOLISM IN CANADA
(Per 100,000 over 20)

Estimated Rates of Alcoholism			
Year	Male (M)	Female (F)	Ratio M/F
1901	2,084	425	4.9
1921	1,043	230	4.5
1931	2,118	500	4.2
1941	2,259	566	4.0
1951	2,627	525	5.0

(After Popham, 1955)

INCIDENCE

The number of new cases each year is even more difficult to ascertain than prevalence. It can be calculated if one knows the number of alcoholics alive in two successive years and the number who have died. The increase in number from one year to the next, plus the number who have died gives the number of new cases. Such calculations must be very crude at present but they indicate that in Ontario at least, the special clinics and mental institutions are giving assistance to only a small fraction of the new cases which are developing each year (6)). Family doctors must see or hear about many more, but their weapons for handling this ailment are very feeble.

PROGNOSIS

Life insurance companies have tried from time to time to assess the added risk of death, imposed by various kinds and degrees of "alcoholic habit." One of the more recent studies was made by the Lincoln National Life Insurance

Company (7). In different categories of "drinkers" the mortality rate was found to be 2 to 5 times the "standard" rate. Accidents and suicides were notably frequent causes of death.

A few clinicians have attempted over a period of years to collect life histories of alcoholics. One such study was reported in 1953 by Dr. Lemere of Seattle (8). He considered it essentially a control study of what happened to 500 untreated alcoholics. Eleven percent of this group stopped drinking prior to their terminal illness. Another 10% moderated their drinking gradually over a period of years until it had become no great problem at the time of death. In this sample the outcome might be called favourable in about 20% of the cases. Can a better outcome be expected from more intensive medical attention, or from Alcoholics Anonymous, or from a combination of the two, as practised in many centres? The answer seems to be yes. But not many agencies at present claim a rate of success which is better than 60% by any criterion (9). Many report a lower rate (10). If the rate of "cure" by methods presently available is so small, it is clear that we should not only try to improve our methods of treatment but also pay more attention to prevention.

AETIOLOGY

It is difficult even in scientific circles to discuss the causes of alcoholism, without arousing unseemly emotion. Scientists, like other people, tend to lean toward one or other of two opposing views which may be stated rather extremely as follows: (1) For most people alcohol is an entirely benign chemical. Therefore, those who become alcoholics must be distinctly abnormal. Find that abnormality and you find the "cause" of alcoholism. (2) Alcohol is a poisonous and addicting chemical. Any person who takes too much too often may become an alcoholic. Investigators who lean towards the first view have tried diligently to discover the abnormality, psychological or physiological which makes the alcoholic (10, 11). If there is an underlying abnormality common to all alcoholics, it has not yet been demonstrated. The various abnormalities which have been found or suggested as causal factors such as homosexuality or undersocialization are not easily curable or preventable. Undoubtedly there is some truth in the first viewpoint but so far it has been rather unproductive of methods of prevention or control.

A picture of the psychological states in a group of alcoholic patients at the Brookside Clinic, Toronto, can be gained from the following description: 2% were psychotic, 14% were psychoneurotic, 47% suffered from some "recognizable personality disturbance" (12). It seems clear that the proportion of alcoholics with serious psychiatric disabilities is rather low. The group is far from being a hopeless one to deal with. Most of them have no insuperable psychiatric handicap to overcome. Another conclusion which I would draw from these and other data is that "the cause" of alcoholism is not any single psychological abnormality.

Many investigators feel that the most important causal factors of alcoholism are related to cultural attitudes toward alcohol (13). The implication in this view is that alcohol has dangerous properties for many if not for most persons and that cultural safeguards are needed. The identification of practical protective attitudes seems to be one of the most hopeful lines of investigation.

Among the various hypotheses of causation, one which is plausible and useful for the orientation of patients has been developed by Dr. R. G. Bell. He summarizes his views as follows: "Alcohol is man's oldest anaesthetic. As with any other chemical one can acquire disease from repeated over-exposure to alcohol. In alcohol addiction we deal with two disorders—the factors responsible for repeated heavy drinking to the point of disease, and the superadded disease from alcohol itself" (14).

It is frequently assumed that the "factors responsible for repeated heavy drinking" are abnormalities or weaknesses. Wellman (15) concludes from his experiences that these factors may be "normal" social situations and pressures rendered more dangerous perhaps by ignorance of possible consequences.

TREATMENT

The most important and perhaps the most successful agency now active in the treatment of alcoholics is Alcoholics Anonymous. It is futile to ask what percent of alcoholics who are introduced to A.A. achieve sobriety through its services. Reliable figures are not available. (The same may be said for most other therapeutic agencies. Strenuous efforts are being made, however, in many clinics to standardize criteria of success and to obtain more records of patients over a long period of time. It is an enormously difficult task.) Most clinics take great pains to foster contacts by A.A. with their patients. Some patients do well in A.A., others will have nothing to do with it. Refusal to accept A.A. does not necessarily mean that the patient will not achieve sobriety. A.A. is not only a recipient of patients from clinics but also an important source of referrals.

There is no quick and certain treatment for alcoholism; no miracle drug! Drugs like disulfiram (antabuse) have an important place in many clinics (9). A new one, citrated calcium carbimide, is undergoing trials at the present time (16). Such drugs render the effect of alcohol very unpleasant. They give the wavering patient, in moments of temptation one good reason not to drink today.

Clinics differ considerably in details of treatment but nearly all of them are attempting the same formidable task, namely to change radically the way of life of persons most of whom are over the age of forty. Most clinics employ internists, psychiatrists, psychologists, nurses and social workers, in a comprehensive service of treatment and re-education which ideally should be continued with each patient for many months and preferably for many years. Such treatment is bound to be expensive. The results at first sight may not seem impressive. If we set as a practical standard of success, sobriety for one year with not more than one temporary relapse the percentage of successes is likely to be rather small, perhaps thirty or forty percent. Such a score is not a true measure of the benefits of a clinic. It is important to realize that every month and even every week of sobriety is a gain of enormous importance to each patient and to society.

With the research which is now being devoted to the study of alcoholism one may hope for improvements in methods of treatment. It is reasonable to hope that treatment may become less an art depending on the inspiration of certain gifted individuals and more a science which can be taught. It seems unlikely

that the need for treatment can be met by special clinics. The task must be undertaken to a greater extent by general practitioners and other members of the health services, if it is to be done at all. An encouraging development has been the increasing co-operation which has been secured from general hospitals for the treatment of the acutely intoxicated alcoholic.

In his annual report for 1955, Mr. H. D. Archibald, Executive Director of the Alcoholism Research Foundation of Ontario (6), raised the question of compulsory treatment for certain defiant alcoholics. The kind of person he had in mind was the man who terrorizes and ruins his family without committing any definite crime. The idea is not a new one in democratic countries and proper safeguards are not hard to design. The problem was discussed at a meeting of the Medico-Legal Society of Toronto in April 1955. A resolution was passed recommending that the province establish facilities and committal procedures for compulsory treatment of defiant alcoholics. A sub-committee was established to pursue the matter to a satisfactory conclusion. It is still at work. The problem is one of particular concern to the general practitioner in Ontario and perhaps in other provinces. The doctor who tries to deal with certain emergency situations involving, for example, an alcoholic who threatens violence to his family, gets little assistance and no protection from the law.

PREVENTION

Since treatment of alcoholism is likely in the foreseeable future, to remain costly and often ineffective, it is of the utmost importance to study methods of prevention. We have no grounds to hope for any prophylactic inoculation for this ailment. We are left only with education. In this country where 70% of the population are not averse to the use, at least occasionally, of alcoholic beverages and where cultural attitudes toward alcohol are chaotic and often fantastic, what shall we teach? How should we teach it? Whatever it is to be, it must be true and convincing. It must be consistent with everyday experience. At present I think that we can only strive for more awareness of the nature of alcoholism and the magnitude of its inroads. Even the latter cannot be taken for granted. We need more surveys critically designed and competently executed. We need more vivid reporting of case histories, with strictest accuracy and sympathetic insight. At present we have no body of doctrine which is accepted by the majority of our citizens and which can therefore be taught with conviction in our secondary schools. A suitable doctrine must be devised if we are ever to control the growing menace of alcoholism.

So far we have found very few points at which alcoholism can be attacked by the usual methods of the public health services. Only the mental hospitals and the mental hygiene services seem to have any affinity to the problem. It is possible that the latter could be used to assess the problem. A better assessment than we have at present is necessary before adequate measures of control can be devised.

Mental hospitals are now taking a greater share in the treatment of alcoholics than ever before. A recent study by Popham (17) has shown that during the last ten years the rate of admissions for alcoholism to Canadian mental hospitals has more than trebled. Most of the admissions for alcoholism are now for alcoholism without psychosis. It would be pointless at this time to

speculate on the many possible causes for this great increase. The fact will suffice to emphasise that many alcoholics need to be incarcerated. Mental hospitals seem to be the only institutions available for this service. Most observers feel that mental hospitals as they are organized and operated at the present time are far from ideal places to treat alcoholics. It might be wise to consider the possibility of designating certain mental hospitals for the treatment of non-psychotic alcoholics, and providing them with the facilities and staff to do so. In some provinces it would be necessary to change the rules for committal and discharge of such patients.

SUMMARY

Estimates of rates of alcoholism indicate very great increases in many parts of Canada during the last five years. In some localities as many as 5% of the adult male population may be alcoholics.

These estimates based on indirect evidence should be tested by surveys in several selected localities.

Facilities for the treatment of alcoholics have been established by five provincial governments. These should be regarded as experimental treatment units. Treatment is prolonged and expensive. Research to improve methods of treatment seems a wiser investment at this time than a rapid expansion of treatment services. Arrangements for compulsory treatment for certain cases should be improved.

Treatment is restoring many gifted persons to useful modes of life. It also fails in many cases. For this reason prevention of alcoholism should be a major goal of public health effort.

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Expenditure Patterns from the Canadian Sickness Survey 1950-1951¹

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FROM the material published to date on family expenditures for health care in Canada, based on the Canadian Sickness Survey, it is possible to comment on national estimates of total expenditures, on national estimates by income groups by family size and by expenditure groups, and on regional variations in expenditures by selected items. For purposes of this paper I propose to restrict comments to three areas: total national expenditures, variations in the pattern of expenditures by income groups, and regional differences in expenditures.

Total National Expenditures

During the sickness survey year 1950-51 it is estimated that Canadian families spent \$373,800,000 for health services and health care insurance. This total, it should be noted, does *not* include expenditures by governments, for public and other technical health services, for personal health care to public assistance recipients and others unable to pay, or for such groups as Indians and Eskimos, veterans, members of the armed forces, and the Royal Canadian Mounted Police. Furthermore, it does not include expenditures on public institutions, such as mental and tuberculosis hospitals. Employer contributions towards the premiums of prepayment plans are not included, nor are bills incurred but not paid during the survey year. When all these are included in 1951, the total would approach \$675,000,000.

Perhaps a better perspective on what this sum represents may be taken from a recent study prepared by our Department which indicates that in 1953—two years after the Sickness Survey—direct consumer expenditures represented about 50% of the total of all personal health care expenditures (i.e. excluding capital expenditures, public health and other technical services). Governments were responsible for providing 33% of the remainder and voluntary insurance plans about 17%. There is no doubt that voluntary insurance plans expanded in the period from 1951 to 1953, but there is no convincing evidence that the share of personal health care expenditures met directly by consumers in 1953 declined over 1951. While the total national bill for personal health care was rising rapidly in the period, national income was also expanding. Personal health services in 1953 consumed just about 4% of net national income at factor cost.

Public and private insurance plans to date have developed conspicuously in the hospital field, and to a lesser extent for physicians' services. The amount of insurance for dental, drug or home nursing services has not been significant. In 1953, public and private hospitals (excluding tuberculosis, mental and federal hospitals) received about \$263,000,000 in operating revenues. Of this

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amount, patients paid directly 36%, voluntary plans paid about 24%, four provincially-operated hospitals plans paid 19%, workmen's compensation schemes 4%, governments on behalf of indigents, veterans, Indians and Eskimos and other groups, 6%, and donations and public statutory grants represented about 11%. If we look at payments to physicians in 1953, however, some of these proportions are quite different. Of estimated payments of \$170,000,000, patients paid directly 61% and government plans of various sorts about 8%. Voluntary insurance, however, met about one-quarter of the total (the same percentage as applied to hospital insurance); miscellaneous sources, including workmen's compensation, about 6%.

Perhaps the most important conclusion to be drawn from this analysis is that, after making all adjustments and in spite of the rapid growth of public and private insurance plans and government programs, consumers are still meeting directly, without the aid of insurance, about 50% of the national personal health care bill.

Variations in the Pattern of Expenditure by Income Groups

Of some 4,500,000 family units in Canada, it is estimated that 86% made some health expenditure on behalf of one or more of their members in 1951, and 14% made no expenditures. We will be anxious to know more about the social characteristics of this latter group with no expenditures. Were they, for example, healthy young single adults, or were they impoverished older persons with a large volume of illness, dependent on public programs and/or the charity of their family doctors? Answers to questions such as these involve cross-tabulations which are technically more difficult and have been postponed to later stages of the Sickness Survey publication program.

The division of the population into two groups—families with expenditures and families without them—has given rise to two sets of average family expenditures which in the beginning created some difficulties of interpretation. A good explanation, based on graphic illustrations, of the differences between the two average concepts is given on page 3 of Special Compilation No. 2. If we divide total expenditures by all families in Canada, it appears that \$82.10 per family was spent for health care. If we look at the 86% of *families with expenditures*, however, the average amount spent was \$95.00. For hospital care, the corresponding averages are \$10.20 and \$68.10 due to the fact that only 15% of all families reported a direct expenditure for this item. It has been possible to secure these two sets of averages by number of persons in the family, and by four income classes. A simultaneous breakdown of average expenditures by family size and income group has not been possible, however, since this would have required an even larger sample than the 10,000 households in the original survey.

Publication No. 3 in the Sickness Survey series deals with family expenditures by income groups. Four broad income groups were employed—incomes of less than \$1500, from \$1500 to \$2999, from \$3000 to \$4999, and over \$5000. The determination of family incomes by questionnaire techniques has never been conspicuously successful in North America, and I am reminded of the recent verdict of a prominent social investigator in the United States who declared that it was easier to get intimate details of the personal sex life of a

middle class American than to learn his (or her) income. The complication of family income, where more than one wage-earner may be present, presents further difficulties. However, some significant generalizations about the pattern of health care purchase by income group can be made.

The proportions of families reporting any expenditures for prepayment by income groups are as follows: Less than \$1500—28.6%, \$1500—\$2999—55.2%, \$3000—\$4999—67.0%, \$5000—64.2%.

It appears that the poorer families, as one might expect, are not purchasing insurance. If we could take out those families compelled by law to pay their hospital premiums in 1951 in British Columbia and Saskatchewan, the variations would no doubt be even more striking. The greatest proportions of families purchasing prepayment are to be found in the middle incomes. The fact that a family does report an expenditure on behalf of one or more of its members for prepayment is not the whole story. It is somewhat startling to learn for example that only 11% of all families in the income class of \$1500—\$3000 in 1950—51 made premium payments exceeding \$60 (which is only about half the premium cost of a minimum level of comprehensive protection for a family) compared to 24% for the families earning over \$5000 in 1951. Even allowing for employer sharing of premiums, the amounts of insurance being purchased must in many cases be very inadequate.

The clearest variation of purchase of services by income group is found for dental care. Under \$1500, only 14% of all families reported any expenditures. From \$1500 to \$2999 the proportion rose to 32%. From \$3000 to \$4999 it rose to 41% and over \$5000 to 46%. The proportion for all income groups was only 27.6% of all families. When we remember that in this field there is practically no prepayment, that organized public programs are almost entirely limited to children, with the exceptions of public assistance recipients in the three most western provinces, and that the great majority of all families will require some dental service by any recognized concepts of adequacy in a twelve-month period, it is obvious that here is a very large area of unmet needs.

Something can also be said about the nature of "catastrophic" expenditures by income groups although here the data needs interpretation. What constitutes a "catastrophic" expenditure is a matter on which opinions will vary a good deal. Ideally it should vary with income, but the nature of income groups used in the survey will not permit close refinements. If we look at spending families only and in particular those families *spending in excess of \$100*, we find that they represented about 15% of all spending families with under \$1500 income. For such families, the average amounts spent were over 15% of family income. When we compare these percentages with the average of 4% of family income often applied to health care in family budgets, the burden of health bills becomes apparent. At the other extreme, over 50% of spending families with incomes over \$5000 spent over \$100 on health care, but their average expenditures were just about the "normal" 4% of family income.

When we look still more closely at the expenditure data, hospital care, when it appears, is a very expensive item although it is recorded for only 15% of all survey families. But direct payments to hospitals represented on the average 16% of income for families with less than \$1500 income, who spent more than \$100 on this item.

A few words might also be said about the purchase of drugs and appliances by income groups. Families with under \$1500 income spending \$40 or more on drugs and appliances were about 12% of all spending families in this income range. Such families spent on the average over \$100 on these items, about 9% of their average incomes. On the other hand, families spending over \$40 on drugs and appliances were 24% of the spending families in the \$5000-plus group, but their average expenditures were only about \$60 or roughly 1% of average incomes. It would be interesting to know more about the social characteristics of the under \$1500 families, to learn whether they represent older groups with a good deal of sickness who get hospital and physicians' services provided through other sources, but have to pay their own drug bills; or whether, on the other hand, they represent families with very limited resources who attempt to substitute patent medicines for other health care.

Regional Variations in Expenditures

The two concepts of average expenditures—namely average expenditures by spending families, and average expenditures spread over all families—are also available by six regions of Canada. If we look at spending families only, British Columbia families spent on the average \$110, followed by Quebec with \$100, Ontario \$99, prairie provinces with \$84, the maritime provinces with \$83 and Newfoundland with \$35. The unique social and geographic characteristics of Newfoundland, together with the existence of its public Cottage Hospital Plan, account for the low estimate for that province. The Quebec average is pulled up by its larger average size of families and its drug expenditures, and the British Columbia average reflects more favourable physician-population and hospital bed ratios, as well as higher general price levels.

Regional variations in expenditures for prescribed and non-prescribed drugs are worthy of a special comment. Quebec spent more per family and in absolute amounts for both of these items than any other region in Canada. In the case of prescribed drugs, Quebec families spent \$16,400,000 of a national total of \$46,100,000; for non-prescribed drugs they spent \$10,800,000 of a national amount of \$26,900,000. An examination of these statistics (and other examples could be selected from the wealth of material available) would lead us into fundamental questions concerning the nature of medical practice and the social and cultural factors influencing the family's demand for services.

In conclusion, I have made some general statements concerning what the Sickness Survey has revealed to us about family health expenditures, and what it suggests may be made available by further cross-tabulations in the future. It appears that approximately 50% of the national bill for personal health care in Canada is still being paid directly by families. Variations in what families of different income levels purchase for health care are apparent—the middle income groups are buying insurance to prepay their bills, and poorer groups are buying larger amounts of drugs and medicines than the higher income families do, to name just two items. Dental care expenditures are reported by little more than one in four families and show a clear variation by income class. Finally, the great range in regional average expenditures must be interpreted in the light of diverse social, economic and cultural variations of a country as large as Canada.

Volume of Illness

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BECAUSE governments, both federal and provincial, today are most immediately concerned with the problems of providing and financing adequate health services, the social and economic implications of sickness have so far been given priority over the medical aspects in the study of the results of the Canadian Sickness Survey. In this discussion too we will be dealing primarily with health and ill-health as a social and economic phenomenon, and with its overall effects. The fact that there is a certain volume of illness in the community makes its impact on the pattern of life not only of the individual but also of the community as a whole. An analysis of what constitutes this volume of illness, e.g. its diagnostic components, and more detail regarding its interrelation with social and geographic factors will have to be left for future studies.

While the Sickness Survey was not expressly limited to physical ills, the results confirm the expectation that very little information on mental illness could be obtained in this particular survey. The data are, therefore, limited largely to physical illness.

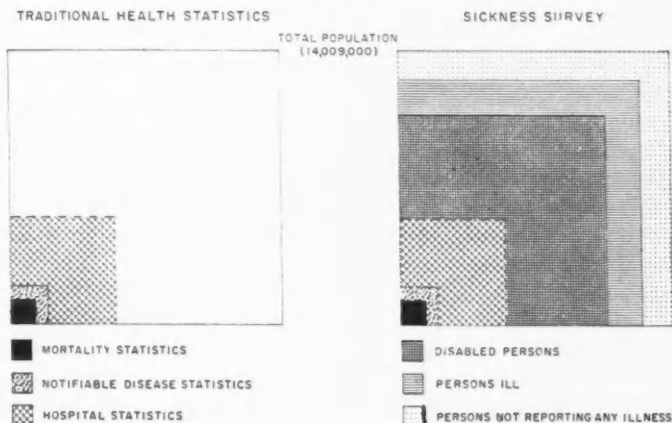
We have known all along what our main health problems are. We know—from our mortality statistics—that the effective control of infectious and other acute diseases has reduced mortality in the early years of life, and that longer life for most people has meant more chronic illness. From the notifiable disease reports we know that some of the communicable diseases, although less deadly than they used to be, are still very much with us: poliomyelitis is one of them, though on its way out we hope, and much remains to be done in the field of tuberculosis. The so-called minor childhood diseases are as prevalent as ever, but with a check on their more serious complications we seem to be inclined to accept their presence as part of the natural pattern of life which no longer deserves our attention. Yet, diseases in children account still for a great deal of disability and medical care.

With all this information already at our disposal, what then has the Sickness Survey contributed to our knowledge? The diagram in Chart I gives a rough idea: the survey has filled in the blank space in the square at the left. This represents an over-simplification because we can compare only the number of persons affected without regard to the duration of illness, its disabling and crippling effects, and its requirements for health services. Furthermore, the lightly shaded area indicating the healthy people reflects only those who are not aware of any disturbance in their health. Multiple screening surveys, the experience of health preservation centres, and other routine examinations of apparently healthy people could help us to a better evaluation of this group. Also, the line between healthy and sick can not be sharply drawn. The

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transition from one to the other is very often a gradual one and it is frequently a matter of highly subjective interpretation, when a person begins to consider himself sick. We may not hesitate, for instance, to count some of the reportedly sick people as healthy if, for instance, they just cut their finger or had the sniffles for a day or two.

CHART 1
SICK PEOPLE OF WHOM WE KNOW
FROM



The purpose of the diagram is simply a comparison of numbers. It does not show, for example, the amount of overlapping of deaths and hospitalization (and people dying without being hospitalized), and of hospitalized people excluded by design from the population covered by the Sickness Survey. Records from the various sources of statistics differ, of course, widely in the amount of information they contain as well as in their quality and accuracy. Mortality statistics are probably the most accurate in the field of health statistics but they provide us only with a count of cases without any indication as to such characteristics as length of illness or disability, amount of health care received, etc. These statistics, however, give us the best available picture of fatal sickness, and death is still the most serious consequence of illness. The Sickness Survey results, on the other hand, have the one big drawback that they are available for one year only.

The shaded area in the chart then indicates the number of people ill about whom we had no knowledge prior to the Sickness Survey. And yet, these people suffer, they are disabled by their illness and absent from work. They require health services which have to be provided and paid for in one form or another. Hence the need for this kind of information from the point of view of public health and of all those concerned in any way with the planning and the administration of health services.

It is not intended to repeat in detail here the published results of the survey,

of which only a few have been summarized in the following tables. These results will rather be used as a basis for some observations regarding the general pattern of illness as revealed by the survey.

We must remember that the figures relate to a twelve-months period during which the country was free from major upheavals such as war or depression but which included the influenza epidemic in the spring of 1951. Influenza cases during that year were generally mild in nature. From other sources we can estimate that the excess of influenza cases probably accounted for less than 5% of the total days of illness found in the survey.

Lacking comparable statistics for other years, the assumption that the survey year was a normal one is, of course, based to a considerable extent on conjecture. As the results of the survey are to be used in the planning for the provision of health services, we should keep in mind that the experience of a "normal" year represents the minimum of sickness we can expect in the immediate future. Any appreciable reduction can only come from improved services and medical techniques, and will therefore be a gradual process. Having at our disposal the record of one year's experience only, we do not know the "average" volume, in time, of illness on which planning should be based. All we can say is that the "average" will be on a level higher than that in a "normal" year because unusual outbreaks will add to the volume of illness during the year while any reduction is likely to be slow and gradual.

Now to the actual results of the survey, bearing in mind that they are estimates derived from a sample which, generally speaking, excluded people residing more or less permanently in institutions.

There we find then that four out of five people in the population are ill at least once during the year. Not all of these are seriously ill nor do they all require medical care. Almost three out of five people, however, are ill enough at some time during the year to be prevented from carrying on with their usual activity, and less than half of all people are forced by illness to stay in bed at one time or another.

The fortunate one out of the five who is feeling "up to scratch" all year may have some medical care; he may have a routine medical examination by his family doctor—maybe this is what is keeping him well—or he may go to the dentist, he may do something about eye glasses, etc. All this relates to one year's experience.

On one given day—the day the survey began—there were less than ten (8.3%) of the population ill. Over a year, this proportion increases to about 80% and, if we had records for a longer period, we would naturally find that the longer the period of observation the more likely people are to be ill at one time or another until finally, by the time of death we all will have had some illness to our record (Chart 2). Also, there are very few people nowadays who do not receive some sort of health services at least as soon as they make their first appearance in this world, and again when they leave it.

It happens, on the average, only once a year per person that one has to stay in bed or is disabled, and on one other occasion is one ill without being disabled. True, for some unfortunate people these two periods of illness may last all year, or longer, whereas for others they are very short.

During the survey year there was an estimated total volume of some 160

million days of disability occurring among Canadians. On some additional 500 million days people complained about minor ills.

CHART 2

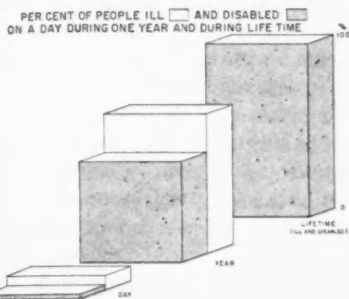
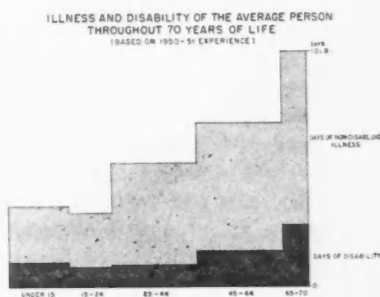


CHART 3



But perhaps the best idea of the impact of illness can be obtained from the fact that, on the average, Canadians are too ill to carry on with their usual activity (play, school, work, housework, etc.) for almost twelve days a year, that is between one and two weeks. It is a little over a week in the middle age groups. This means, under a five day work week, six or seven working days. There are, to use a round figure, about five million people in the labour force. These would lose about 30 to 35 million days from work due to ill health. Expressed in a different way, it means that some 130 thousand Canadians have to work all year just to make up for the time lost through illness. In other words, we have a working force the size of the Canadian Civil Service or the Canadian National Railways working all year in order to make up for the time lost by those who are ill. Had we to pay each one of these extra workers \$2500 a year, this payroll would amount to about 35 million dollars. This does not take into account the impact on the family created by illness of the wage earner or the housewife.

These figures border on the astronomic but they should not create the impression that Canadians are a very sickly people: we still have, again on the average, more than 50 weeks left in the year to carry on with our jobs and to enjoy our holidays. Our experience here in Canada is, to say the least, well in line with what is known, for instance, about the United States. However, this indirect cost of illness added to some 800 million dollars we are spending on health services, and to the cost of maintaining the disabled and their dependents gives some idea of the saving that any reduction of illness means, be it through improved care for the sick or particularly through prevention.

If we talk of the social and economic implications of illness in terms of dollars, let us not lose sight of the fact that it is the primary function of health services, public and personal, to relieve human suffering and misery. We would have to maintain and improve these services even if sickness did not keep people away from work for a single day. We should try to prevent and to cure sickness even if there were no material return for it and even if it would not save a single cent in other ways.

The human element plays a dual role in a nation's social and economic life. It is at once subject and object of the economy. That it is an economic factor as

productive labour and as consumers, is only one side of the picture although a very important one because the people are a country's main resource. We must keep in mind, however, that the value of man lies beyond economic considerations. Man, in the last resort, is the ultima ratio of any economic system which, therefore, should serve man and his wants, and not man serve the economy. Life and health, so closely connected with each other, are the most fundamental of man's wants, assets to be preserved individually as well as collectively. If we find that good health is also good business, so much the better: and we do know that good health eliminates waste in manpower, reduces the need for medical care and public assistance, prolongs the productive life span, and so forth. Health, in Emerson's words, "answers its own ends, and has to spare; runs over and inundates the neighborhoods and creeks of other men's necessities".

To come back now to the "average Canadian" it will be well to keep in mind that this very elusive fellow does not exist. Very few of us, if any, will have that average experience. Many will have less illness and some unfortunate ones

TABLE I
THOSE REPORTING HEALTH AND THOSE REPORTING ANY ILL-HEALTH
DURING A TWELVE-MONTH PERIOD

Age	HEALTH		ANY ILL-HEALTH	
	Per cent of population		Per cent of population	
	Never disabled	Never ill	Disabled sometime	Ill sometime
Both sexes				
All ages	41.5	19.6	58.5	80.4
Under 15	30.5	12.8	69.5	87.2
15-24	45.9	27.3	54.1	72.7
25-44	45.4	20.2	54.6	79.8
45-64	49.0	23.4	51.0	76.6
65 and over	45.7	21.0	54.3	79.0
Male				
All ages	43.8	22.3	56.2	77.7
Under 15	30.8	13.1	69.2	86.9
15-24	51.5	30.7	48.5	69.3
25-44	50.0	25.5	50.0	74.5
45-64	49.6	26.8	50.4	73.2
65 and over	47.2	22.6	52.8	77.4
Female				
All ages	39.3	16.8	60.7	83.2
Under 15	30.2	12.4	69.8	87.6
15-24	40.4	23.1	59.6	76.9
25-44	40.6	15.2	59.4	84.8
45-64	48.7	20.5	51.3	79.5
65 and over	44.2	19.2	55.8	80.8

SOURCE: Canadian Sickness Survey 1950-51, National Estimates (No. 5)

among us will have much more than the average. Nor is there any telling when illness will strike and to what extent. But, as pointed out before, not being concerned here with the distribution of illness, the average gives a good indication of the overall size of the problem on a national scale.

What then is the amount of illness the average person experiences throughout a lifetime of say seventy years? We don't know the exact answer because we don't know whether people had more or less illness in years previous to the survey and we don't know what their experience will be in the future. In other words, we have no longitudinal records at our disposal. But if we assume that for any particular age group the sickness experience does not change too much within a lifetime, we obtain a pattern as shown in Chart 3.

The percentage of people ill or disabled at some time during the year does not vary too much between the age groups (Table I). The only exception, in fact, are the children under 15, of whom there are more reported sick than of people at older ages. But while younger people may be sick as often or even more often than the older ones, the latter have the more serious and the longer illnesses (Table IV).

TABLE II

THOSE REPORTING HEALTH AND THOSE REPORTING ILL-HEALTH ON A GIVEN DAY

Age	HEALTH		ILL HEALTH	
	Per cent of population		Per cent of population	
	Not disabled	Not ill	Disabled	Ill
Both sexes				
All ages	97.1	91.7	2.9	8.3
Under 15	}	98.2	}	4.6
15-24		95.3		4.7
25-44		97.5		8.9
45-64		95.5		12.1
65 and over		93.0		18.6
Male				
All ages	97.3	92.3	2.7	7.3
Under 15	}	98.3	}	4.6
15-24		95.5		4.5
25-44		98.0		6.9
45-64		95.5		10.9
65 and over		93.0		16.7
Female				
All ages	96.9	90.7	3.1	9.3
Under 15	}	98.1	}	4.7
15-24		95.1		4.9
25-44		97.0		10.9
45-64		95.5		13.5
65 and over		93.0		20.5

SOURCE: Canadian Sickness Survey 1950-51, National Estimates (No. 7)

On the average, people are disabled once a year, that is they are unable to go to school, to work, etc. On one other occasion they are sick but not sufficiently to be kept from their usual activity. This applies to all age groups with the exception again of the children who are sick and disabled more often than their elders. The experience is the same for boys and girls but at older ages females are sick more often.

The pattern of sickness varies among the sexes but in interpreting the Sickness Survey results it must be remembered that confinements are included as illnesses, not because they are considered an abnormal state of health but because they are conditions causing disability and requiring a considerable amount of health care. Females have more days of illness than males (Table III). They have, however, somewhat fewer days of disability on the whole.

A large proportion of the women are homemakers and in these cases the decision of what constitutes disability is not as clear cut as in the case of the person who stays home from his outside place of work. But some of the difference may well be real: further tests may give us a clue. Women, after all,

TABLE III
AVERAGE DAYS OF HEALTH AND ILL-HEALTH PER PERSON
IN THE POPULATION PER YEAR

Age	HEALTH		ILL HEALTH	
	Free of illness	Free of disabling illness	Any illness	Disabled
Both sexes				
All ages	313.6	353.1	51.4	11.9
Under 15	330.1	354.6	34.9	10.4
15-24	332.9	356.6	32.1	8.4
25-44	311.4	355.7	53.6	9.3
45-64	294.1	349.7	70.9	15.3
65 and over	263.1	338.2	101.9	26.8
Male				
All ages	320.4	352.9	44.6	12.1
Under 15	331.1	354.2	33.9	10.8
15-24	337.2	357.3	27.8	7.7
25-44	322.5	356.0	42.5	9.0
45-64	304.1	348.6	60.9	16.4
65 and over	273.5	337.4	91.5	27.6
Female				
All ages	306.6	353.3	58.4	11.7
Under 15	329.0	355.0	36.0	10.0
15-24	328.6	355.9	36.4	9.1
25-44	299.8	355.3	65.2	9.7
45-64	283.6	351.0	81.4	14.0
65 and over	252.5	339.1	112.5	25.9

SOURCE: Canadian Sickness Survey 1950-51, National Estimates (No. 5)

have a higher life expectancy, and perhaps the fact that they report, and therefore are aware of, more minor illnesses may be instrumental in avoiding some of the major complications. These are only conjectures but they are supported to a certain extent by a comparison of the duration of disabling and non-disabling sickness among males and females (Table IV). The average duration of disability is longer among males than among females in all age groups, but females report longer non-disabling illnesses that is, generally speaking, minor illnesses. A certain amount of bias may have been introduced by the fact that the informants were mostly women.

CHART 4

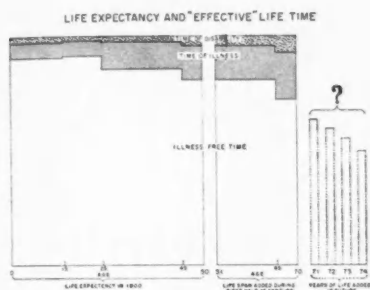
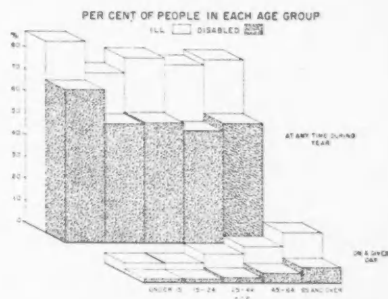


CHART 5



On further studying the "average Canadian", we find that during a life time of seventy years he would have been ill for almost four thousand days (3,844), or altogether ten years out of his life time. He would have been unable to carry on with his job or whatever his usual activity was at different ages, for more than 800 days (866), or altogether more than two years. During his working life alone he would have been disabled for a year and six months (576 days) and during that time have lost over 400 working days.

With this record of sickness, what then is the health pattern of our life? Life expectancy gives us some indication and permits an assessment from a different angle of the impact of sickness on our society. It is a good means of measuring the health of the community in a general way and over the years. If, to speak in round figures, we assume that life expectancy at birth has increased during the last half century or so from somewhere between forty-five and fifty years to seventy years, and if we assume further that productive life, after schooling and training, begins at the age of twenty, the expectancy of potentially productive life has almost doubled, from about twenty-five to fifty years. Chart 4 indicates the distribution of health and ill-health during the expected lifetime, based on what we know from the Sickness Survey. We assume, therefore, that in any age group the amount of illness would have been the same fifty years ago as it is today. We find then that the block of years we have added to our life expectancy over the last fifty years contains an increasing proportion of sick time. Every new year of life we add now will be made up of more and more sickness, and less and less health—if, and that is the big question mark, we do not succeed in reducing the diseases of old age. Here then is the challenge: to make these added years truly years of "life", for: "non est vivere, sed valere

TABLE IV
AVERAGE DURATION (DURING A YEAR) OF SICKNESS PERIODS

Age	Days per	
	Complaint period	Disability period
	Both sexes	
All ages	23.7	10.8
Under 15	12.4	6.8
15-24	18.5	9.2
25-44	25.8	9.9
45-64	40.6	17.5
65 and over	60.6	23.9
	Male	
All ages	22.2	11.6
Under 15	12.0	7.0
15-24	18.5	9.8
25-44	24.1	11.0
45-64	38.7	20.1
65 and over	59.1	31.5
	Female	
All ages	25.0	10.0
Under 15	12.7	6.7
15-24	18.5	8.7
25-44	27.1	9.0
45-64	42.1	15.1
65 and over	61.9	26.4

SOURCE: Canadian Sickness Survey 1950-51, National Estimates (No. 5)

vita". We do not want to add to our life years of suffering and misery but of effective life, not to use the word "productive" which perhaps has too much of a purely economic connotation. Whether we should then extend our actual working years by postponing the retirement age is a different question. After all, increased productivity due to technological advances has permitted us to reduce voluntarily actual working life in several other respects: reduced working hours, shorter work week, and longer holidays.

Chart 5 also emphasizes the problem of illness among the older people. On a given day, we find the proportion of people ill increasing with age (Table II). This does not apply to the figure for the whole year because people are counted here regardless of the duration of their illness or disability so that a child ill for only one day is counted the same as an old man suffering from a chronic disease all year round. This part of the chart brings to mind again, however, that besides the problem of old age there is another one which, though less serious, should not be lost sight of entirely. This problem is the relatively high volume of illness at the other extreme of the age scale, the children under 15. Since many of the childhood diseases have been rendered harmless, we have become complacent about them. But they still cause much disability, they represent a considerable source of demand for medical care and an ever present potential source for complications. Children under 15 still account for almost one-fifth of all home and office calls by doctors, they show the highest

percentage of all age groups of persons ill or disabled at some time during a year, and, on the average, children have more days of disability during a year than their elders up to about 45 years of age.

So far we have been talking about ill-health only, the negative side of the health picture. Oddly enough, what we call health statistics have always been only sickness statistics. This is understandable because in order to prevent and to cure illness, we want to know first of all how much and what kind of illness there is and what causes it. But prevention means more than merely guarding against certain diseases. In order to become truly effective, it must also be aimed at maintaining health. This "healthful living" is the result of many things: improved social conditions, nutrition, education, and other broad and general measures whose effect can become apparent only after years, and even then it may be hard if not impossible to measure them in relation to certain specific changes in our way of life. These changes lack the dramatic and spectacularly instant effect of smallpox, diphtheria or poliomyelitis vaccination, but their results reach perhaps even farther because of their more general impact. For this aspect of health protection it will prove useful to know not only what causes certain diseases but also what helps to maintain good health: the epidemiology of health.

We should, therefore, in addition to studying illness, also try to find out more about the healthy people, who they are, what their characteristics are, where they live and how, and so on. A very crude attempt has been made in the following tables to show data for the healthy as well as for the ill. The method followed is crude indeed because considered as healthy were simply those who reported no illness in the survey, that is the residual group. Because of the mostly gradual transition from health to illness it will always be hard and to some extent arbitrary to draw a distinct line separating one from the other. The figures given here will lend themselves to greater refinement as more of the survey results become available.

Let us see then what the situation is on a given day, the prevalence of health if you wish (Table II). When we leave our house in the morning on our way to work, we can figure that 97 others out of a hundred people in our block will likewise be getting ready for another day's activity. Five or six of them may be feeling somewhat "under the weather" but only three will have to stay home because they are sick.

Over a year, we find that not quite half the people (41.5%) never missed a day, and about twenty out of a hundred (19.6%) never complained even about minor illnesses (Table I).

The average person feels entirely free from any illness for about 300 days of the year and is sufficiently well to carry on with his usual activity for 343 days.

The tables indicate for the healthy, as for the sick, substantial differences between the various age groups. In general, it is the younger middle age group, 15 to 24 years, that enjoys the best record, males having fewer disability free days than females. More characteristics of the healthy population will become available as the survey tabulations continue. It will then also be possible to extend the concept of health, if desired, to include say minor injuries and perhaps even minor illnesses.

Having general morbidity statistics available for the one year only, we had to assume for some of our conclusions that sickness experience does not change too much over a number of years. We know, of course, that changes do occur, changes for better as well as for worse. The development of medical science and technique, and improved health services have practically eradicated some diseases and reduced others in terms of volume and severity. Better sanitation, improved living conditions and a better informed public all tend to prevent and reduce illness. On the other hand, our longer life span means more chronic and degenerative illness; the technological advance has brought about many improvements but has also brought us into contact with hazardous substances and increased the chances of accidents. This may be so for the individual but the volume of sickness in the country as a whole is, of course, affected by changes in the population. Average days of illness per person of a given age and sex, for instance, may not change too drastically but a 50% increase in our population over the last twenty years meant in itself a corresponding increase in the days of illness. Thus, if we have to cope with some 160 million days of disabling sickness per year, this means that we have about 50 million more of these days now than we had in 1931. If the population continues to increase according to some of the forecasts, we will have added almost another 100 million days of disability per year in another twenty years—an indication of the need for expanding health services.

Because of the higher proportional increase in the older age groups, the average number of disability days per person per year would have increased from 11.4 days in 1931 to 11.9 days in 1951. The number of days of any illness would have increased during the same period from 49.2 to 51.4 days. Whereas we would have found 78 out of a thousand people ill on any day in 1931, we have 83 today due to the impact of aging.

In concluding it should be emphasized again that these notes are concerned only with the total volume of illness and its impact upon the life of the community as a whole. It would be dangerous and misleading to draw conclusions from overall averages to the problems resulting from sickness either to the individual or the family. To assess these problems, it will be necessary to study the distribution of sickness and its characteristics. Future tabulations from the Sickness Survey will permit such a more adequate interpretation of the overall results. It will then be possible to discuss the diagnostic groups making up the total volume of illness, its distribution among various income groups, its pattern in rural and urban areas, and other social characteristics. The Canadian Sickness Survey 1950-51 has made it possible to establish a bench mark for the state of health of Canadians and its implications. To measure future progress in the field we will have to look for further studies.

Problems of health and ill-health were, until fairly recently, regarded generally as a matter for the medical man and the philanthropist only. Today the provision of health services has become a major concern of governments. From the Sickness Survey we know now more about how much and what kind of illness there is necessitating the services provided and the expenditures incurred.

A Case of Anthrax in Man Contracted from a Cow in Ontario

D. G. INGRAM* and D. A. BARNUM**

ANTHRAX is a disease of rare occurrence in Canada. In April, 1954, the deaths of a number of horses and cattle were reported to the Ontario Veterinary College on a farm situated in Ontario on the north shore of the St. Lawrence River. The deaths had occurred over a period of several years. All animals had been pastured in one field and the farmer suspected that someone had poisoned them. The regional veterinarian visited the farm and a search of the field failed to reveal any poisonous plants. A good deal of trash was present and several paint cans, partially empty, were found. It was postulated that the animals had died of lead poisoning. The farmer was advised to clean the field and was asked to notify the regional laboratory immediately if any more deaths occurred so that post mortem and laboratory examinations could be conducted.

On August 4, 1955, approximately 16 months later, word was received that another animal, a three year old Jersey cow, had died. The pasture was not the one which had been under suspicion the year previously. The animal had been in good condition and appeared normal the evening before death. When the herd was being driven to the barn for the morning milking, this animal began to show weakness, collapsed after going a short distance, and died within three quarters of an hour. Struggling or convulsions just prior to death were not observed although these symptoms are common in cases of peracute anthrax in cattle.

Necropsy findings—A small amount of bloody faeces was noted at the anus but no blood or discharge was present at the mouth or nostrils. Subcutaneous haemorrhages, oedema and "tarry" blood, described as characteristic of cases of anthrax, were not observed. A serofibrinous peritonitis was found localized around the reticulum. The reticulum contained several short pieces of wire. A haemorrhagic enteritis, most severe in the anterior duodenal region, was present. The mesenteric lymph nodes were much enlarged and haemorrhagic, especially those draining the anterior portion of the small intestine. The spleen was about one and one-half times the normal size and contained much dark-coloured blood. The lungs were congested but the trachea appeared normal. The liver, kidneys, and heart were essentially normal in appearance.

Laboratory examination—Direct smears made from the liver and spleen revealed long chains of large, gram-positive rods. Staining of tissue smears for

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one minute with 1% aqueous methylene blue showed capsular material characteristic of M'Fayden's methylene blue reaction. A pure culture of large, gram-positive rods was obtained from the liver, spleen, and lymph nodes. The organism grew profusely on blood agar producing colonies which were non-haemolytic, dull, opaque, and greyish-white with irregular margins. Broth culture showed the organism to be non-motile. In gelatin stab cultures the growth resembled an inverted fir tree. Seven mice were inoculated intraperitoneally with 0.1 ml. of culture and four guinea pigs were inoculated similarly with 0.2 ml. All the mice were dead in 18 hours. The guinea pigs died within 36 hours. Smears from the mice and guinea pigs tissues demonstrated capsulated organisms. The bacillus was re-isolated from the animals' tissues.

The findings justified the conclusion that the organism was *Bacillus anthracis*.

Microscopic examination of tissue sections from the bovine revealed generalized congestion and showed the presence of many rod-shaped bacteria in the splenic pulp, sinusoids of the liver and lymph glands and in the capillaries of the lung, kidney, and heart.

Case Report (human)

On August 9, 1955, a small papule appeared mid-way between the elbow and wrist—just above the glove line—on the lateral surface of the right forearm of the veterinarian who had performed the necropsy. A period of five days had elapsed since the post-mortem examination but during this period he had handled the tissues of the animal and cultures of the organism. The papule slowly enlarged and on August 12, it was about 5 mm. in diameter. At this time it was opened and smears and a culture were made of the exudate. The stained smears revealed a large, gram-positive bacillus which gave the M'Fadyean's methylene blue reaction. Bacteriological examination and animal inoculation of the organism cultured from the lesion showed it to be identical to the organism isolated from the cow. A sensitivity test revealed the organism to be sensitive to penicillin, aureomycin, terramycin, and erythromycin.

A physician was consulted immediately and the veterinarian was hospitalized on August 12. The axillary lymph node, slightly enlarged, was palpable at this time. On admission of the patient to the hospital, antibiotic treatment was instituted which consisted of 1,500,000 units of penicillin and 1.5 gms. of dihydrostreptomycin administered daily in three doses intramuscularly and 1000 mg. of ilotycin administered orally in 200 mg. doses five times a day. At this time the body temperature was normal. The next day the lesion was slightly enlarged and had started to form a vesicle centrally.

On August 14, a rise in temperature to 103° was accompanied by headache, vertigo, diarrhoea, and anorexia. The next day the temperature was 102°, the dizziness had passed, and the appetite was normal. The vesicle enlarged and burst during the day, forming a black eschar around which a fresh row of vesicles developed. These vesicles subsequently burst, the central black eschar increased in size, and more vesicles formed peripherally. On August 15, when the central darkened area was about 10 mm. in diameter, a swab was taken from the lesion but culture failed to show growth. A blood sample was

also taken at this time and a w.b.c. count of 5100 per cu. mm. and a sedimentation rate of 5 mm. was reported. The lesion continued to develop until August 17, when the black eschar was 20 mm. in diameter and the surrounding swelling extended over most of the lateral aspect of the forearm. The lesion was not painful but a tenseness of the arm was felt. A photograph of the arm was taken at this time. On August 17 the blackened skin was removed and the under-lying exudate cultured but once again no viable organisms were isolated. The lesion began to dry and the surrounding swelling gradually reduced. Recovery was uneventful. On August 24 the patient was discharged from the hospital. The eschar, which is characteristic of the infection, remained in place until September 19 and separation left a scar.

DISCUSSION

The disease in the cow was somewhat unusual in that convulsions were not noticed before the death of the animal; no subcutaneous oedema or blood tinged fluid was present; and the mouth, nostrils, and trachea did not contain blood. The spleen was enlarged and the intestine inflamed but otherwise there were no significant pathological changes.

In animals, peracute anthrax may be confused with other conditions producing sudden death such as lightning stroke, sunstroke, and lead poisoning. Less acute cases of anthrax may be mistaken for malignant oedema, haemorrhagic septicaemia, blackleg, or sweet clover poisoning.

The infection in the human was typical except that the incubation period was longer than normal and the early development of the lesion was slow. As pointed out by Ellingson *et al.* (1), Gold (2), and Reilly and Beeson (3), the anthrax lesion in man continues to advance through a well defined typical cycle in spite of antibiotic treatment and in spite of the absence of viable organisms. This continued progression is explained by the "tissue damaging factor", probably a toxin, which is responsible for the spreading, haemorrhage, and necrosis of the lesion which continues to exert an effect even after viable organisms are no longer present. It is generally considered that cases of anthrax treated with antiserum did not exhibit this phenomenon, probably because the serum inactivated the toxin.

In humans, the skin infection may be mistaken for a common pimple or boil until the lesion is well developed. In pneumonic and enteric forms of human infection the true cause of the condition may not be recognized clinically and many of these infections are fatal.

Laboratory isolation of the organisms may be prevented by the administration of antibiotics early in the disease. In animals the presence of many gram-positive organisms, particularly in carcasses undergoing putrefaction, makes isolation of the organism and proof of its pathogenicity necessary before final diagnosis can be made. Thompson (4) has recently described a blood culture technique as an aid to the diagnosis of suspected anthrax. Defibrinated blood or serum is used as a medium to culture the organism which is then smeared and stained to demonstrate the capsule. In Thompson's hands, this test has proven more sensitive than guinea pig inoculation.

INCIDENCE OF INFECTION

The incidence of anthrax in Canada has been low during the past 30 years, 22 human infections and 8 deaths are recorded as being due to anthrax. In some periods, more deaths are shown than cases reported. This is due to the fact that the record of deaths is essentially complete since the cause of all deaths must be reported on the death certificate. However, the reporting of cases may be incomplete. Nine of the cases and four deaths were in the province of Quebec while three cases and one death occurred in Ontario. During the same period there were more outbreaks in animals in Ontario than in other provinces, i.e. 18 of the 39 listed. Ontario and Quebec together accounted for the great majority of the outbreaks. The outbreaks occurred primarily in cattle but cases were recorded in a sheep and a horse. Bain (5) reported a case in ranch mink.

Stein and Van Ness (6) review the incidence in the United States during the last ten years. In 1952 the United States had the greatest number of cases ever to be reported, due principally to the feeding of infected bone meal to herds of swine in the midwest. Only 34 of the 483 persons infected with anthrax from 1945 to 1954 in United States were agricultural workers and eight were veterinarians. Anthrax in humans in the United States appears to be a greater problem in industrial than in agricultural workers.

The marked difference between the incidence in Canada and the United States is indicated by the occurrence of only 9 outbreaks in animals in Canada during 1945-54, with 4 human cases and 3,447 outbreaks in animals in the United States with 483 cases in man. It is of interest that the locality in which the present bovine case occurred is adjacent to an area in New York State where a number of outbreaks have taken place. One month later, one other bovine case occurred on a farm in the same area in Ontario.

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Some Practical Aspects of Bulk Milk Haulage¹

J. E. WATT,² D.V.M., D.V.P.H.

DURING the past few years much has been written about the bulk system of milk haulage.

As far as I know, Ideal Dairy, Oshawa, was the first in Canada to adopt bulk haulage. This change occurred in May 1953. This was a rather bold move and one which would likely prove impractical and would be regretted.

Despite the increasing number of bulk routes in operation, there are still critics who consider the bulk haulage as fraught with too many difficulties or even impossible. The main argument is that it entails an expense on the farmers concerned. It is therefore interesting to note that the pioneer group of producers who adopted bulk haulage did so because they believed that they would benefit financially.

Of the twenty producers supplying Ideal Dairy all but four agreed to install bulk coolers. Happily, three of these found other markets while one chose to cease shipping milk. Following the change over, another farmer dropped out and one producer of Guernsey milk was taken on, making a total of sixteen.

A major expense was, of course, the coolers. There were two makes installed, all of the sweet-water type, and in four sizes—12, 25, 30, and 40 can capacities. Costs ranged from \$1460.00 for a 12 can cooler to \$2600.00 for a 40 can cooler, the average being \$1875.00. In some cases new milk houses had to be built or at least renovations made. Some farm lanes had to be improved and hydro bills were increased. All this represents a considerable investment by each farmer. Yet, as stated, the producers supplying Ideal Dairy gained financially. To begin with, their haulage rates were 20¢ per 100 lbs., as compared to 25¢ and 27¢ paid by can shippers at the other two dairies. In addition, a premium of 3¢ per 100 lbs. was paid, plus another 3¢ if all Board of Health tests are reported as Grade 1 for an entire year. In 1954, all producers but three qualified for this quality premium.

The total cost of sixteen coolers now in operation was \$30,000. The average daily amount of milk shipped from sixteen farms was in excess of 15,000 lbs. At 11¢ per 100 lbs. the extra daily gain was \$16.50 or \$6,000 per year. This seems a very good return on the money invested, even after allowing for depreciation on the cooler and the other expenses involved. In addition to the actual increase in revenue per pound of milk, it is important to note that on the can system, there were twenty producers supplying a daily average of 11,700 lbs., whereas now sixteen supply an average of 15,800 lbs. daily; and in 1954, 100% of the base set for every producer was paid in full. In other words, more milk was sold at top price than ever before. Thus actual returns for money invested were greater than the \$6,000.00 per year as calculated.

¹Presented at the annual meeting of the Ontario Public Health Association and Canadian Institute of Sanitary Inspection (Ontario Branch), Royal York Hotel, October 6-8, 1955.

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It must also be remembered that some of the expenses incurred, for example, new or improved milk houses were essential in any type of milk production. If you compare costs of cooling milk properly by the bulk method to cooling by conventional methods you would find that it costs more to cool milk in cans if the requirements of quick cooling and a low temperature are to be met.

All farmers changing over to bulk haulage do not receive similar benefits as those granted by the Ideal Dairy. Some dairies make no allowances whatsoever to farmers. In such cases, hardships to the producer must exist. And in such cases, I would think that the Government Board responsible for fair practices are failing in their responsibility, for no dairy should be permitted to reap benefit at the expense of its producers.

The smallest producer of Ideal Dairy ships over five cans of milk daily, and perhaps this is about the least amount which can be handled economically with bulk haulage. Here we have the major stumbling block to the system. The farmer who produces one or two cans of milk daily, as a side-line without proper facilities, is still tolerated. In future, this difficulty may tend to correct itself, for I know that in the Oshawa milk shed, there is more milk produced each year and from a smaller number of farms. The number of small "mixed" farmers is steadily becoming less. Milk production is a major industry, and a vital one. Production of the largest quantity of milk of top quality, as economically as possible, should be the goal. This objective is not possible for the farmers shipping daily one or two cans. It may be said that bulk haulage is not feasible in certain areas because all the producers are too small. With a little leadership however, there would be a sufficient number of small producers who would be willing to expand if given fair financial return.

Bulk milk haulage has many obvious advantages to operations in the dairy. Substantial reductions in the cost of handling the raw product are realized through less trips to farms, less trucks to operate and less personnel to do the same work load. The cost of cans, their washing and maintenance are eliminated as well as the equipment required and including can washer, dump vats, and weigh scales. Less personnel in the dairy are needed. Savings are considerable on steam and on cooling costs. Valuable space is saved and the advertising potential is a fact worthy of mention. The system lends itself very well to shorter work weeks and a reduction in the number of home deliveries.

A few can rinses will convince anyone that cans with their milkstone and rust are a detriment to any quality control program and their elimination is a blessing. I have always held that improper cooling is the most common single cause of poor raw grades, and two years with bulk haulage has strengthened this belief.

In general, one milking going into an empty tank is cooled to 50° in less than one hour and to the minimum of around 35° within one and one-half hours. With one day's supply already cold in the tank, the following milking raises the temperature very little since small amounts are added to the cold reserve at one time. Thus milk is picked up at the farm at a temperature averaging 35° and is held at this temperature until it reaches the processing plant.

The cost of the tank truck operated by Ideal Dairy, capacity of 180 cans, was \$13,000. Producers are split into two routes, one route being picked up each

day, so that every farmer is serviced every other day. It has proven cheaper to operate this truck than the can system of collection. The haulage charges are 20 cents per 100 lbs. The truck does double duty and serves as storage vat for raw milk. During the heat of Summer the temperature of milk stored rose only 2° in twelve hours. Jersey or Guernsey milk must, of course, be picked up separately.

Some believe that bulk haulage would be impossible in their sections of the province because of road conditions. Undoubtedly this is a greater problem in some areas than in the Oshawa milk shed. Yet, this spring our roads were in the worst condition remembered by local farmers, and not one bulk pick-up was missed. As an insurance measure, the dairy has available a small portable stainless steel tank of 50 can capacity, which can be carried on a small pick-up truck or on a sled or other vehicle pulled by a tractor. Milk can be thus transferred from the farm tank to the truck should it be unable to travel farm lanes or side roads. To date this tank has never been used by the dairy, for it has been found that the truck can travel roads which other vehicles find impassable.

Of greatest importance to public health is the improvement of the milk quality resulting from a change-over to bulk haulage. It is in this respect that it establishes its value as the best system of collection yet devised.

In our experience two advantages were demonstrated—milk cans were eliminated and cooling to a low temperature is quickly achieved. In a word, bulk haulage assures an efficient cooling while the milk is stored on the farm. New regulations are unnecessary, but water under pressure should be available in the milk house and tank designs should comply with 3-A sanitary standards. Bulk shippers should not be asked to provide facilities which are not asked of others, or regulations regarding quality be made more stringent.

Fears in the minds of critics have proved groundless, namely, dirty tanks, off-flavours spoiling an entire truck load, and the growth of psychrophilic organisms. Washing and sanitizing the bulk coolers has not proven to be a problem as the driver rinses the tank with cold water immediately after it is emptied, and the farmer washes and disinfects it before using it again. All but two producers use an Iodophor type detergent sanitizer for this purpose and results have been uniformly excellent. In addition this detergent prevents the formation of milkstone and is effective in cool water. Tank designs make all parts readily accessible, and the cleansing has to be done only every second day.

The dairy did experience trouble with off-flavoured milk when bottled. The source was traced to improper feeding of ensilage, and the driver of the tank truck failed to detect it at the farm, since the odour was very marked in the milk house. It is possible that odours are more difficult to detect than with individual cans.

The main problem with the coolers has been in obtaining prompt and efficient servicing when needed and some high counts have resulted on this account.

To prove the merits of bulk haulage, a summary has been made of laboratory

results covering samples from these producers, compared to those from can shippers. The figures are presented for the years 1954 and 1955.

In 1954 a total of 237 raw samples were taken from bulk tanks. These were collected personally at the farm. Laboratory results were as follows: Resazurin grade 1-232 (97.9%), resazurin grade 2-3 (1.3%), resazurin grade 3-0 (0%), resazurin grade 4-2 (0.9%). Of the samples 99.2% were grades one and two. Samples from the milk shed excluding Ideal producers averaged 93.3% grades one and two. This difference of 6% may not seem impressive, unless you know how difficult it would be to raise a group of can shippers from 93% to 99%. All of the five samples reported less than grade one showed an increased leucocyte count.

In 1955, January 1 to August 31, a total of 182 samples were taken and the laboratory results were as follows: Resazurin grade 1-175 (96.1%), resazurin grade 2-4 (2.2%), resazurin grade 3-3 (1.6%), and resazurin grade 4-0 (0%). Of the samples 98.3% were grades one and two. Two of the samples reported grade three were from a farm where Sunday pick-ups were not made and the samples tested were held for four days at the farm. Five of the seven samples reported as less than Grade 1 showed an increased leucocyte count.

During the exceptionally hot months of June and July 1955, 100% of bulk samples tested were reported to be Grade 1. For the same period, less than 60% of samples from can shippers were Grade 1.

Thanks to the very fine co-operation of the Provincial Branch Laboratory, Peterborough, standard plate counts were made on many of the raw samples in addition to resazurin grade tests.

Counts on 160 bulk samples were reported as follows: 10,000 and under-41 (25.6%), 10,000 to 20,000-37 (23.1%), 20,000 to 50,000-31 (19.3%), 50,000 to 100,000-23 (14.3%), 100,000 to 200,000-8 (5%), over 200,000-20 (12.5%).

The largest group have counts under 10,000 and 68% have counts of 50,000 or less. Such figures may not seem significant to those who have been doing resazurin grades as the sole test of quality. From personal experience, I am sure that where a milk shed is considered as highly satisfactory as judged on resazurin grades, bacteriological plate counts will show a much less satisfactory picture. Such findings would jar many out of their complacency.

A total of 437 samples taken from can shippers from April to August 1955 were subjected to plate counts. A total of 198 of these samples or 45% had counts over 200,000. For the same period, only 8% of samples from bulk producers had such counts. In July alone, only 33% of 85 can samples had counts of under 200,000.

With one or two exceptions, the physical conditions of farms using bulk haulage are no better than those shipping by cans; in fact some premises are unsatisfactory in many respects. The pronounced differences in quality, therefore, can be attributed only to bulk coolers with their advantages.

It should be mentioned, too, that some of the bulk samples had been held one day and some two days on the farm before being picked up. All samples are held overnight after pick-up and sent to the laboratory next day, so that some of the bulk milk tested was actually three days old. No difference in

quality resulted between the one day and two day old samples. On a few occasions, three farms were missed on Sunday pick-ups so that a few samples tested were actually five days old before reaching the laboratory.

SUMMARY

1. Bulk haulage has been proven to benefit producers and the dairy operator, financially, in one milk shed. This is possible in any milk shed providing that the dairy operator treats his producers in a fair manner. Admittedly, the system tends to eliminate the part-time small producer.

2. Milk of superior quality is obtained through the use of this system and public health authorities should take the lead in encouraging the adoption of this system.

3. Some disadvantages accompany the system. These may be greater in some milk sheds than in Oshawa, especially when private trucking firms are involved and when fluid milk is picked up in conjunction with milk for manufacturing purposes.

Another Oshawa Dairy is now adopting bulk collection of milk. It is expected that by next Summer (1956) 100% of Oshawa producers will be operating under this system. I feel sure that then the raw milk quality over the entire shed will be second to none in the Province.

TWENTY-FOURTH ANNUAL CHRISTMAS MEETING

OF THE
LABORATORY SECTION
CANADIAN PUBLIC HEALTH ASSOCIATION

CHATEAU LAURIER, OTTAWA
DECEMBER 10 and 11 1956

FURTHER INFORMATION CAN BE OBTAINED BY WRITING TO
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THE FOOD AND DRUGS ACT AND FOOD SANITATION

IN the June issue of the Journal, Dr. F. S. Thatcher and colleagues of the Food and Drug Directorate of the Department of National Health and Welfare, presented the results of studies made during the past three years to determine the incidence in Canadian cheese and milk supplied to cheese factories of extraneous matter and of specific bacteria usually considered to be of public health significance. The article dealt also with the comparative sanitation of cheese factories and the extent to which cheese may serve as a vehicle for distribution of a specific pathogen. The findings are disturbing. Unsanitary production methods including inadequate cooling and the use of milk from mastitic cows are factors contributing to the contamination. The presence in both milk and cheese of manure fragments, rodent and bovine hairs, and feather barbules in many samples, indicate unsanitary conditions. These provide physical evidence of fecal contamination from at least three sources—rodent, bovine and avian. The authors suggest more stringent control of milk for manufacturing in accord with that practiced for the fluid milk market and a marked improvement in the sanitation of factories, including the personal hygiene of the workers. The Federal and Provincial health authorities are endeavouring to correct these conditions and substantial progress is being made. It is pertinent to review the Food and Drugs Act in its relation to the sanitation of food.

The purpose of the Food and Drugs Act is consumer protection. It is intended to provide protection from health hazards and fraud in the consumption or sale of food, drugs, cosmetics and medical devices. This includes its role in the protection against health hazards which can result from food manufactured, packed or stored under unsanitary conditions and also in a measure with the fraud or deception which can occur in the sale of food which contains filth or other disgusting matter, even though no direct health hazard can be attributed to the food. The consumer expects his food to be free from insects and their excreta, rodent hairs and excreta, manure, etc.

Before the revision of the Food and Drugs Act in 1953, the concern of the department in respect of sanitation was limited by the existing law to the requirement, that the food itself contain no disgusting or rotten material and that it be not harmful to health. In practice this meant that action under the Food and Drugs Act could be taken only if a particular sample of food was found to violate these requirements and the action was limited to a prosecution for selling the adulterated portion of food from which the sample was taken. Although this portion of food could be seized and disposed of by destruction, there was usually no way of tracing other shipments from the same batch and the contaminated lot of food could have been sold through many retail outlets. Furthermore, a manufacturing establishment that is dirty and in which the

processing is not conducted with respect for cleanliness, is not likely to produce only one or two bad batches of food, and the removal of one lot or perhaps only part of one lot from the market, will not correct the situation. In addition to this difficulty, the sheer number of batches of foods of different kinds produced in Canada in a year, make the control at the retail level ineffective.

Having in mind this situation and the labour and expense involved in this method to assure a clean food supply, it was deemed desirable to provide for control at the source when the Act was revised in 1952. The amendments passed by Parliament in 1953 were as follows:

Section 4 states that:—

"No person shall sell an article of food that

- (a) has in or upon it any poisonous or harmful substance;
- (c) consists in whole or in part of any filthy, putrid, disgusting, rotten, decomposed or diseased animal or vegetable substance;
- (e) was manufactured, prepared, preserved, packaged or stored under unsanitary conditions."

Section 7 states:—

"No person shall manufacture, prepare, preserve, package or store for sale any food under unsanitary conditions."

Section 2(n) defines unsanitary conditions as:—

"(n) 'unsanitary conditions' means such conditions or circumstances as might contaminate a food, drug or cosmetic with dirt or filth or render the same injurious to health."

Section 21 of the Act grants Food and Drug inspectors the authority to inspect places where food is manufactured, preserved, prepared, packaged or stored and various other powers necessary to enforce the requirements of the Act. In addition, the Governor in Council may make regulations respecting the method of preparation and manufacture of foods in the interest of public health. The studies by Dr. Thatcher and his colleagues as published, were only part of the studies conducted by the Food and Drugs Directorate. The studies were essentially bacteriological in nature but included examinations for ordinary filth and insect contaminants. The studies have indicated clearly that a significant number of manufacturing plants were dirty and that it could not be expected that food manufactured under such surroundings could be suitable for human use.

Since the amended Food and Drugs Act became effective in July 1954, the Food and Drug Inspection Services have been engaged in a systematic survey of cheese factories, chicken canneries, abattoirs not federally inspected, flour mills and warehouses. This program is being carried out in conjunction with the provincial and municipal authorities who also have an important interest in this field. The Department has developed a close liaison with the provincial authorities in the efforts to improve conditions. Reports from district and regional inspectors of Food and Drugs indicate that there is now a large measure of collaboration between the Food and Drug inspectors and inspectors of other departments concerned. This is most encouraging and will increase the effectiveness of all inspections.

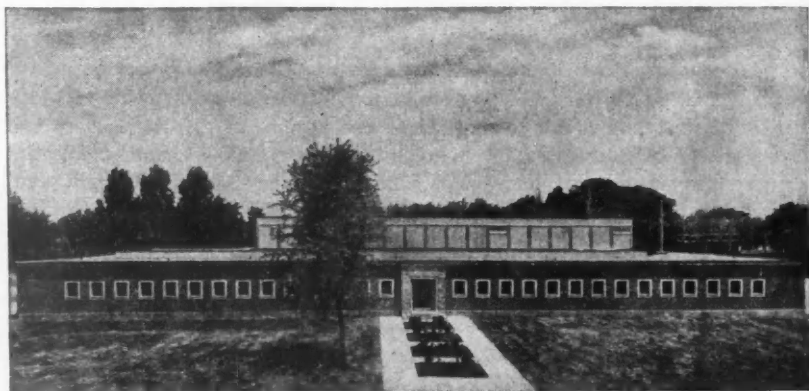
Canada has a most comprehensive and effective Food and Drugs Act. It is now in a position, in cooperation with the provincial and local authorities, to effect further improvements in the sanitary conditions in food manufacturing plants throughout Canada. The Department of National Health is to be commended for the steps which have been taken and it is hoped that further study will indicate a marked improvement in sanitation.

Special Article

New Poliomyelitis Building, Connaught Medical Research Laboratories, Dufferin Division, University of Toronto

A NEW building to provide enlarged facilities for the production of poliomyelitis vaccine (Salk) was opened at the Dufferin Division of the Connaught Medical Research Laboratories on June 22nd. The new laboratories have been constructed and equipped at a cost of approximately one and a quarter million dollars by the Connaught Medical Research Laboratories. The preparation and distribution of vaccine in Canada has been made possible through the cooperation of the Federal and the Provincial departments of health.

The building is designed to permit of the isolation of all procedures in which living poliomyelitis virus is handled and to bring together in one building the many procedures required in the preparation of the Salk vaccine. Commodious animal quarters for monkeys and other animals have been provided. The entire building is air-conditioned. The architects were Messrs. Marani & Morris, Toronto, and the general contractors, A. E. Rule & Company. The building provides approximately 25,000 sq. ft. of laboratory space and was erected in a period of only nine months.



New Poliomyelitis Vaccine Building, Connaught Medical Research Laboratories, Dufferin Division, Steeles Avenue West.

The Honourable Paul Martin responded to the official welcome by Colonel W. E. Phillips, Chairman of the Board of Governors of the University of Toronto. The Honourable Leslie M. Frost, Prime Minister of Ontario, addressed the guests and presented the key to the Director, Dr. J. K. W. Ferguson. Following the cutting of the ribbon by Mr. Martin and Mr. Frost, the guests were conducted on a tour of inspection.

The addresses of the Honourable Paul Martin and the Honourable Leslie Frost are presented herewith:

Honourable Paul Martin, Minister of National Health and Welfare, Ottawa, Ontario:

I am happy to participate in the opening ceremonies for this new Polio Building which will provide the Connaught Medical Research Laboratories with improved and extended facilities for the production of Salk polio vaccine. Two months ago I was happy to take part in similar ceremonies at Montreal's Institute of Microbiology. I am sure that the combined resources of these two new laboratories will ensure to the people of Canada a substantial and continuing supply of safe and effective vaccine sufficient to meet all our needs.

In any review of the development of the Salk polio vaccine, the Connaught Medical Research Laboratories must loom large. It was here that three research scientists—Morgan, Morton and Parker—who were then working on a project in the field of cancer research produced a synthetic medium for tissue cultures—medium 199—that was later to make the large-scale production of the polio vaccine possible. This laboratory also prepared the major portion of the culture fluids for polio virus used in the manufacture of the vaccine for the 1954 field trials that led to the Francis Report of April 12, 1955. And it is this laboratory that has provided all the vaccine used in Canada's immunization program that has been carried out with such encouraging results during the past two years.

The administration of Salk polio vaccine in Canada has provided an outstanding example of co-operation between governments at the federal, provincial and municipal levels. Because of the existence of the National Health Program, it was possible to provide the necessary funds to speed research into polio and to take full advantage of the benefits of the vaccine once it became available. And it might be noted that, in the past few years, federal grants totalling some \$3,400,000 have been devoted to the fight against polio. These funds have been used for the purchase of the

vaccine itself, for fundamental research, for gamma globulin, for the provision of respirators and other essential therapeutic equipment and for the rehabilitation of polio victims.

It is not surprising that Canada should look to institutions like the Connaught Laboratories and the Institute of Microbiology to undertake such difficult assignments as the production of Salk vaccine. Over the years these two laboratories have consistently pioneered in the development and production of new weapons to help prevent disease and human suffering. Connaught's history, for example, dates back to the first world war when the laboratories prepared large quantities of tetanus antitoxin to be used in the prevention of lock-jaw among the Canadian Armed Forces. Other major projects have included the production of diphtheria toxoid, typhus vaccine, dried blood serum for the treatment of war casualties, and the large-scale production of penicillin for the Canadian government to meet the needs of the armed services during World War II.

Nor is it surprising that governments in Canada should undertake to supervise and finance a public health project of the magnitude of our polio immunization program. One of the truly significant features of our social development in recent years has been the growing acceptance by governments at every level of a share of responsibility for the health and well-being of their people. This does not mean—and I am sure that Premier Frost would agree with me—that governments are assuming responsibilities that properly belong to the individual or that the citizen is gradually becoming a ward of the state. It is simply a recognition of the essential fact that governments should be the servants and not the masters of the people they represent. . . .

In one of his messages to Congress, President Eisenhower put it this way:

"Because the strength of our nation is in its people, their good health is a proper

national concern; healthy Americans live more rewarding, more productive and happier lives."

This same thought was expressed by our late Prime Minister, the Right Honourable Mackenzie King, when he introduced the National Health Program to Parliament in May, 1948. These are the concluding words of Mr. King's statement at that time:

"Of all a nation's resources, its human resources are unquestionably the most precious. The preservation in health and strength of its population is surely the best of all guarantees of a nation's power, of its progress and of its prosperity. Our greatest national asset is the health and well-being of our people."

The remarkable similarity in these two statements by a President of the United States and a Prime Minister of Canada is no coincidence. They reflect a common concern for health and a mutual respect from the individual citizen—attitudes that should characterize any truly democratic government. In Canada, as in the United States we accept the proposition that a nation derives its strength from its people and that freedom can only flourish where human welfare is

safeguarded and human personality respected.

Considerations of this kind have been responsible for the success of the co-operative efforts of provincial and federal governments in improving the health services of this nation. And just as the governments of this country have produced beneficial and constructive results by working together on such important projects as the extension of our hospital facilities, the encouragement of medical research and the administration of far-reaching immunization programs, I am sure that co-operation will be the key to success in the establishment of the proposed hospital insurance program now under discussion.

In closing, let me express to Dr. Ferguson and his colleagues the congratulations of the Government of Canada and the gratitude of the people of this country for all that they have done to help alleviate the suffering and hardship caused by poliomyelitis. In the distinguished tradition of his predecessors, Dr. J. G. FitzGerald and Dr. R. D. Defries, I am sure that Dr. Ferguson will continue to earn for this institution a proud place in the national life of Canada.

Honourable Leslie M. Frost, Premier of Ontario:

The Connaught Medical Research Laboratories are part of the University of Toronto. These laboratories had a very small beginning in 1914 with the establishing of a laboratory for preparing diphtheria antitoxin. Since then it has expanded its work into a multitude of fields dealing with many phases of our life. The laboratories have really become a huge industry. Development here of poliomyelitis vaccine is an example of the efficiency of this great organization. It is my pleasure today to take part in the official presentation of this building, in which our province is heavily interested.

There are many to whom I could pay tribute, including the present director and the staff, Dr. J. G. FitzGerald and Dr. R. D. Defries,

previous directors, Sir Albert Gooderham who was the first chairman of the Connaught Committee of the University's Board of Governors, Dr. H. G. Cody, Balmer Neiley, John S. Tory and the present chairman, Arthur Kelly and others who have made very worthy and distinguished contributions to this work.

This institution has done a wonderful work. Its excellence is attested by an accomplishment outstanding in America. The discovery of poliomyelitis vaccine by Dr. Salk produced an emergency. The job had to be done. Connaught is substantially doing this, not for Ontario but for all Canada.

As head of the Government of Ontario, perhaps I could take some satisfaction from this, but I do not intend to do so. I rather have come to tell

you here that what we are doing for research, and by that I mean our country as a whole, is simply not good enough. Fine as are our accomplishments here today, there is no reason for satisfaction or complacency. It is vital to our nation that we should be doing much more.

I have said on other occasions that we have no shortage of resources. I am satisfied that with prudent administration there will be no shortage of the capital to do the job. Where we are going to face shortage, and are facing shortages now, is in manpower, men and women with the education, training and know-how to do the job. A survey and a thorough understanding of our situation is overdue.

In a few words let me give you the picture. Education is clearly a function of the provinces. It is a function of our province. Ten years ago our elementary and secondary school attendance was 660,000. On September 1st next year it will be 1,100,000. To that number each year you can add another 70,000, which means that ten years from now our school attendance will be 750,000 more than today.

Provincial assistance has increased by \$25,000,000 (or 42%) in the last three years and still the cost of education is mounting and will mount. We are presently giving serious and intensive study to the whole problem of this cost. The primary and secondary phases of education are close to our people. They are close to our municipalities and it is unavoidable that they will receive top consideration and the whole problem of higher education, including the vital research factor will receive what is left. That is not good enough. The Province has been doing its very best. We have been making greatly increased contributions to higher education and to research which is conducted not only at the universities and affiliates such as the Connaught Laboratories, but at the Ontario Research Foundation, Ontario Agricultural College and the Ontario Veterinary College. Our expenditures this year exceed \$25,000,000, which is twice as much as we spent in education altogether twelve years ago.

The point I want to make is this—that the matter of university education and research is not one which in 1956 we can relegate to the province by a clause in the Confederation Act, in the drawing of which the Fathers of Confederation could not anticipate world crises such as 1914-18 and 1939-45 nor the battle of peace upon which the future of Canada, and indeed a survival of democracy depends, in this year of 1956. This situation is one of winning the battle for the survival of our way of life. It is time we recognized it as such. That is why I come here today, not to talk of what we have done, but rather to point out what we must do.

The present full-time enrolment of our universities and colleges in Ontario is 22,000. To our family of universities we have been able to add four in the last eight years. By 1965, only nine years from now, our university enrolment will be 44,000 instead of 22,000. By 1975 our forecasts indicate a possible quadrupling of this number of pupils, resulting in a total possible enrolment of 90,000 instead of 22,000 in less than twenty years. Already in this day of scientific advancement—this nuclear age, upon which we are only on the fringe, manpower is becoming the problem. Materials and money are not the unsuperable problems. It is men and women to do the work. When we know that the communistic world is surpassing us in the number of those trained in mathematics, in the sciences and in research, it is not an occasion for complacency but for our re-examination, re-assessment and action. All of our history, opportunities and our high conceptions of the dignity of man may mean little in meeting the consequences in the years to come of this vital shortage of men and women.

May I point out that the Connaught Laboratories serve all Canada. This service of the University of Toronto, without which Canada could not begin to combat poliomyelitis and other diseases, is not a Provincial but a National Institution in its effect. The same is true of our Dental College which is helping to supply dentists for provinces which have not

a dental college and cannot afford one. Similarly, our medical colleges, agricultural and veterinary colleges make their contribution to the whole of Canada.

Of course, the need is for a closer working arrangement between the federal, provincial and municipal governments to win the requirements of peace as we won the requirements of war.

Great as are our accomplishments in our universities, it is poor satisfaction to know that we simply have not enough trained young people. Students who will graduate from our universities and from our research laboratories will be the leaders of tomorrow. Upon their skills will depend the development of our country. Greater opportunities for our young people to obtain higher education strengthens the whole fabric of our nation and our system, for upon not only well-educated and enlightened people, but upon people skilled in science, depends the continuation of our democratic way of life. This is vital and fundamental. If we overlook this fact, we are burying our heads in the sand. Today, medicine, engineering, mathematics, physics, chemistry and the other applied sciences require expansion. From the standpoint of the development and the training of human resources some of our present efforts look pitiful. There is a pressing need for administrators and executives of all kinds. If we lag in these fields, we are lagging in world development. In this great day of opportunity and responsibility, Canada cannot afford to lag. These needs are so important, so fundamental to every phase of our country's activities that they cannot be left to haphazard treatment by ten provinces which can only afford to give them what is left over. This is top priority. As a country we should take stock at once and then apply the appropriate action.

I do not think I can be accused of lack of cooperation, I have never hesitated to cooperate with other governments, even when it appeared to be unpopular, if I felt it was in the

interests of my province. I am not crying "Wolt, Wolt!", nor using the question of relations of various levels of government because it is politically expedient. I believe it is fundamental to our nation. As a people we met the challenges of the dark days of 1940 and the days that followed. The challenges of these days are just as important and vital to the survival of our way of life. May I point out that the provinces and their municipalities are the right arm of development in times of peace and let us not forget that we are now engaged in a great battle of winning peace. Let us reassess our position realistically. What we did in the war days of ten and more years ago has little validity today. The emphasis is in a different direction. We should assess it all in the light of 1956. A closer practical working arrangement is required between federal, provincial and municipal governments to win the requirements of peace as we won the requirements of war. The things I mention, including research and its possibilities which is emphasized today, transcend all provincial boundaries. It becomes the job and indeed the vital interest of every level of government. If we are going to keep Canada in the forefront there is a great task ahead in expanding university facilities, recruiting and properly paying staff, developing and encouraging research in a practical way. These things are vital.

In presenting this building to the Director, may I thank him, and through him, all of the others who are presently associated, and have been associated, with the great success of this institution and the great contribution which it is making to our country. My words today are meant to emphasize the importance of this work, past and present, and the need for expansion and support. It is a pleasure to take part in this ceremony of presentation and to hand to the Director this new poliomyelitis vaccine building. We all know that it will be used to its limit, and beyond its limit, to further the work of this great institution.

**ONTARIO PUBLIC HEALTH ASSOCIATION
AND
CANADIAN INSTITUTE OF SANITARY INSPECTORS
(ONTARIO BRANCH)**

**JOINT CONFERENCE AND ANNUAL MEETING
KING EDWARD HOTEL, TORONTO**

September 24, 25 and 26, 1956

P R O G R A M

Monday, September 24, 9.00 a.m.

REGISTRATION

Monday, 9.30 a.m.

MINISTER'S CONFERENCE FOR MEDICAL OFFICERS OF HEALTH

BALLROOM

THE HONOURABLE MACKINNON PHILLIPS, M.D., Minister of Health. Senior Officers of the Department of Health for Ontario will discuss—

Recent Legislation

Tuberculosis Prevention—Present Trends

Poliomyelitis 1955-56

Epidemiological Trends

Studies to Date

The Future?

Public Health Nutrition

Maternal and Child Care

Present Status of Civil Defense

Report on 1956 Area Conferences

Monday, 2.00 p.m.

The Water Resources Commission

Present Status Milk Legislation

Pest Control Act

Infectious Hepatitis—question and answer panel

Monday, 9.30 a.m.

DENTAL PUBLIC HEALTH SECTION

BLUE ROOM

The Program of the Burlington Orthodontic Research Centre.

DR. FRANK POPOVITCH, M.Sc.D., Director of the Centre.

Program Co-ordination with Voluntary Professional Agencies.

DR. M. G. BOYES, Vice-Chairman, Dental Public Health Committee, Ontario Dental Association.

Monday, 9.30 a.m.

VETERINARY PUBLIC HEALTH SECTION

ELIZABETH ROOM

Symposium on Mastitis.

Participants:

DR. J. E. WATT, Public Health Veterinarian, Oshawa.

DR. DONALD A. BARNUM, Ontario Veterinary College, Guelph.

DR. RICHARD GUTHRIE, New York State Veterinary College, Cornell University, Ithaca, N.Y.

DR. S. D. JOHNSON, New York State Veterinary College, Cornell University, Ithaca, N.Y.

MR. F. H. S. NEWBOULD, Ontario Veterinary College, Guelph.

Monday, 10.00 a.m.
**CANADIAN INSTITUTE OF SANITARY INSPECTORS
(ONTARIO BRANCH)
AND
ENVIRONMENTAL HYGIENE SECTION O.P.H.A.**

RECEPTION ROOM

A Sanitary Survey of a Watershed.

MR. JAMES SANDUL, Health Department, Sudbury.

Paper Provides Protection.

MR. P. C. FOWLER, Lily Cups Limited, Toronto.

Monday, 12.30 p.m.

LUNCHEON

SHERATON ROOM

Speaker: DR. P. E. MOORE, Director, Indian Health Services, Department of National Health and Welfare, Ottawa.

Subject: The Health Challenge of the North.

Monday, 2.00 p.m.

DENTAL PUBLIC HEALTH SECTION

BLUE ROOM

Long Range Plans in Dental Health Program.

DR. F. A. KOHLI, Director, Dental Services, Department of Health, Ontario.
Business Meeting.

Monday, 2.00 p.m.

PUBLIC HEALTH NURSING SECTION

SHERATON ROOM

Business Meeting.

Monday, 2.00 p.m.

VETERINARY PUBLIC HEALTH SECTION

ELIZABETH ROOM

Panel Discussion—Flavours in Milk.

Moderator—DR. D. F. DAMUDE, Halton County Health Unit, Milton.

Members of Panel—

PROFESSOR F. W. HAMILTON, Ontario Agricultural College, Guelph.

DR. D. M. IRVINE, Ontario Agricultural College, Guelph.

MR. HERMAN CAUTHERS, Lakeview Dairy Limited, Barrie.

DR. DAVID GARRICK, Simcoe County Health Unit, Barrie.

Business Meeting.

Monday, 2.00 p.m.

**CANADIAN INSTITUTE OF SANITARY INSPECTORS
(ONTARIO BRANCH)
AND**

ENVIRONMENTAL HYGIENE SECTION

RECEPTION ROOM

Some Aspects of Food Sanitation.

MR. ROBERT FORD, Department of Public Health, Toronto.

Concrete in Sanitation.

MR. G. WOOD, Canada Cement Company Limited, Toronto.

The Use of Black Light in Sanitation.

MR. H. C. JONES, Canadian General Electric Company Limited, Lighting Institute, Toronto.

Monday, 4.30 p.m.

HEALTH OFFICERS' SECTION

BALLROOM

Business Meeting.

Monday, 6.00 p.m.

RESOLUTIONS AND NOMINATION COMMITTEE O.P.H.A.

PRESIDENT'S SUITE

Monday, 7.30 p.m.

ANNUAL MEETING, BOARD OF DIRECTORS, O.P.H.A.

PRESIDENT'S SUITE

Tuesday, September 25, 9.00 a.m.

HEALTH OFFICERS' SECTION

BALLROOM

Vital Statistics for the Medical Officer of Health.

DR. A. H. SELLERS, Director, Division of Medical Statistics, Department of Health, Ontario.

Participation of the local official Health Agency in Industrial Hygiene Services.

DR. G. E. DUFF WILSON, Medical Officer of Health, Kitchener.

The Industrial Health Service Demonstration at Kitchener.

DR. R. B. SUTHERLAND, Industrial Health Division, Department of Health, Ontario.

Tuesday, 9.00 a.m.

PUBLIC HEALTH NURSING SECTION

SHERATON ROOM

Panel Discussion—Nursing Care in the Home as Part of a Health Unit Program

Chairman—

MISS MURIEL K. LOWREY, Regional Supervisor, Division of Public Health Nursing, Department of Health, Ontario.

Members of Panel—

DR. CHARLOTTE M. HORNER, Medical Officer of Health, Northumberland-Durham Health Unit, Cobourg.

MISS LOUISE STEELE, Nursing Supervisor, Northumberland-Durham Health Unit, Cobourg.

MISS IDA WILLIAMS, Public Health Nurse, Northumberland-Durham Health Unit, Cobourg.

The Role of the Nurse in the Total School Program.

DR. ADELE C. BROWN, Director, School Health Section, Board of Education, Oswego, N.Y.

Tuesday, 9.00 a.m.

PLUMBING INSPECTORS' SECTION

RECEPTION ROOM

Business Meeting.

The Need for Adequate Plumbing as a Safeguard for Health.

DR. C. D. FARQUHARSON, Medical Officer of Health, Scarborough Township.

Tuesday, 9.30 a.m.

VETERINARY PUBLIC HEALTH SECTION

ELIZABETH ROOM

Fluid Milk Quality—The Need and the Method.

DR. J. E. WATT, Department of Health, Oshawa.

Factors Affecting Manufactured Milk Quality.

DR. F. J. HARDEN, Department of Health, Peterborough.

Tuesday, 9.30 a.m.

PUBLIC HEALTH DENTAL SECTION

Visit to 430 Broadview Ave.

The Riverdale Preschool Demonstration Project, Department of Public Health, Toronto.

Tuesday, 9.30 a.m.

**CANADIAN INSTITUTE OF SANITARY INSPECTORS
(ONTARIO BRANCH)**

AND

ENVIRONMENTAL HYGIENE SECTION

YELLOW ROOM

Some Problems in Publishing a Paper.

MR. B. V. BEDORE, Editor of Newsletter.

Legal Aspects of the Public Health Act.

MR. ALEX MACDONALD, Department of Public Health, Toronto.

Subject to be Announced.

MR. C. L. HODGKINS, Director, Technical Development Division, Diversey Corporation (Canada) Limited.

Tuesday, 2.00 p.m.

GENERAL SESSION

BALLROOM

The Human Side of Public Health.

DR. B. D. McNEEL, Director, Community Mental Health Services, Department of Health, Ontario.

Newer Trends in School Health.

DR. ADELE C. BROWN, Director, School Health Section, Board of Education, Oswego, N.Y.

Tuesday, 4.00 p.m.

ONTARIO PUBLIC HEALTH ASSOCIATION

BALLROOM

Annual business meeting.

Tuesday, 7.00 p.m.

ANNUAL DINNER

BALLROOM

Speaker: THE RIGHT REVEREND W. E. BAGNALL, B.A., D.D., Bishop of Niagara.

Wednesday, September 26, 9.00 a.m.

**PUBLIC HEALTH NURSING SECTION
DENTAL PUBLIC HEALTH SECTION
HEALTH OFFICERS' SECTION
JOINT MEETING**

BALLROOM

Symposium—Cleft Palate Rehabilitation.

Moderator—DR. M. A. COX, Hospital for Sick Children, Toronto.

Speakers—

DR. NORMA K. WALKER—"Genetics"

Hospital for Sick Children, Toronto.

DR. ROSS JOHNSON—"Medical Reporting"

Hospital for Sick Children, Toronto.

DR. W. K. LINDSAY—"Plastic Surgery"

Hospital for Sick Children, Toronto.

DR. J. B. WHALEY—"Nose and Throat"

Hospital for Sick Children, Toronto.

DR. W. J. SPENCE—"Orthodontic Correction"

Hospital for Sick Children, Toronto.

MISS RUTH LEWIS—"Speech Therapy"

Hospital for Sick Children, Toronto.

Wednesday, 9.30 a.m.

**VETERINARY PUBLIC HEALTH SECTION
ENVIRONMENTAL HYGIENE SECTION
CANADIAN INSTITUTE OF SANITARY INSPECTORS
(ONTARIO BRANCH)
JOINT MEETING**

YELLOW ROOM

Latest Developments of Dairy Industry Sanitation.

DR. N. E. LAZARUS, President, Lazarus Laboratories Inc., Division of West
Disinfecting Company, Buffalo, N.Y.

Wednesday, 12.30 p.m.

LUNCHEON

SHERATON ROOM

Speaker: MR. LEO DOLAN, Director, Canadian Government Travel Bureau, Ottawa.

Subject: "Know Canada Better."

Wednesday, 2.00 p.m.

GENERAL SESSION

BALLROOM

Recent Advances in Child Care.

DR. H. W. BAIN, Hospital for Sick Children, Toronto.

Rabies Menace.

DR. K. F. WELLS, Veterinary Director-General Production Service, Department of
Agriculture, Ottawa.

EMPLOYMENT SERVICE

Sanitary Inspector required for health unit. Experience in milk sanitation desirable. Salary range \$2,800-\$3,900. Car expense account, pension plan, Blue Cross, P.S.I., and group insurance. Five day week, three weeks annual vacation. Apply to Medical Officer of Health, The Lambton Health Unit, Sarnia, Ontario.

8-9

Laboratory Technician for new 150 bed general hospital in Batavia, New York, midway between Buffalo and Rochester, New York. Minimum salary \$3300 to \$3600 depending on qualifications. Applications from Canadians invited. Apply to Genesee Memorial Hospital, 127 North Street, Batavia, New York.

8-9

Public Health Nurses (qualified) for City of Oshawa. Four vacancies. Generalized program in urban area Starting salary (without previous experience) \$3100. Annual increment \$120. Transportation provided. Five day week. Pension and hospitalization plans are available. Apply to Dr. A. F. Mackay, Medical Officer of Health, City Hall, Oshawa, Ontario.

8-9

Public Health Nurses required for a generalized program in Etobicoke Township (suburb of Toronto). Starting salary \$3,200. Annual increments to \$3,680. Further increases above \$3,680 by merit rating. Starting salary based on experience. Car allowance \$670 per annum. Four weeks vacation after one year. Blue Cross and pension plan. For further details contact Personnel Director, Township of Etobicoke, 4941A Dundas Street West, Toronto 18. Telephone BE-1-4161.

8-10

Public Health Nurse required in a generalized program in rural and semi-urban area adjacent to Metropolitan Toronto. Excellent working conditions, including pension plan, group insurance and transportation arrangements. Write to Dr. R. M. King, York County Health Unit, Newmarket, Ontario.

8-9

Public Health Nurses required for a generalized program in suburban and rural areas with Peel County Health Unit. Unit headquarters near Toronto. Salary range \$3,000-\$3,600. Pension plan, transportation allowance, cumulative sick and holiday leave. Optional Blue Cross and P.S.I. protection. Apply to Mrs. Helen Littleton, Supervisor of Public Health Nursing, Court House, Brampton, Ontario.

8-9

Assistant Medical Officer of Health required by Peel County Health Unit. Minimum salary \$6,000 per annum. Duties to commence September 1, 1956. For details of employment write to Dr. D. G. H. MacDonald, Medical Officer of Health, Court House, Brampton, Ontario.

8-9

Two public health nurses required for generalized program in city of 43,000. Blue Cross and P.S.I. employer shared. Transferable accumulative sick leave and pension plans. Workmen's compensation. Group insurance available. Transportation provided or allowance—10¢ first 2000 miles, 8¢ per mile thereafter. Five day week, month vacation with extra time at Christmas. Salary scale: \$3,000 for inexperienced nurses to start with annual increments of \$150. All starting salaries dependent on experience. For further information please write, supplying details of training and experience to Medical Officer of Health, City Hall, Peterborough, Ontario.

7-8

Wanted by City of Toronto, Department of Public Health. Nutritionist with Bachelor's Degree in Home Economics and the successful completion of a dietetic internship or approved equivalent. Some experience in the community nutrition field is desirable. Salary: \$3726-\$4266 per annum, 35 hour week, annual increment, vacation, sick pay and pension plan benefits. Apply to the Personnel Department, Room 320, City Hall, Toronto, Ontario.

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